WHAT IS CLAIMED IS:

1. A heat fixing apparatus comprising:

a fixing member;

a pressurizing member in pressure contact with said fixing member to form a fixing nip for holding and conveying a recording material on which an unfixed image has been formed so that said unfixed image formed on the recording material would be fixed as a permanent image;

an electro conductive member to be in contact with the recording material disposed downstream of said fixing nip with respect to a recording material conveying direction;

bias applying means for applying a variable bias voltage to at least one of said fixing member and said electro-conductive member; and

bias control means that varies, in the case that recording materials on which unfixed images have been formed are consecutively fed, the bias voltage applied by said bias applying means gradually or stepwise while the recording materials are passing.

2. A heat fixing apparatus according to claim 1, wherein, in the case that a state in which feeding of a succeeding recording material has already been started by feeding means of an

image forming apparatus at a time when a trailing edge of a preceding recording material passes a portion of the fixing nip, said bias control means determines that the recording materials are consecutively fed and decreases the bias voltage to be applied while the recording materials are passing gradually or stepwise.

3. A heat fixing apparatus according to claim 2, wherein in an intervening period between the preceding recording material and the succeeding recording material during which the fixing member and the pressurizing member are in direct contact without a recording material between, said bias control means turns the bias voltage off.

4. A heat fixing apparatus according to claim 2, wherein said bias applying means includes at least one of means for applying a bias voltage with polarity same as that of toner to an electro-conductive part of the fixing member and means for applying a bias voltage with polarity reverse to that of toner to an electro-conductive part of the pressurizing member, at least one of said means being capable of varying the bias voltage, and an electric potential difference between the electro-

conductive part of the fixing member and the electro-conductive part of the pressurizing member before a leading edge of the recording material comes into contact with the electro-conductive member disposed downstream of the fixing nip with respect to the recording material conveying direction is larger than the electric potential difference between the electro-conductive part of the fixing member and the electro-conductive part of the pressurizing member while the recording material is in contact with said electro-conductive member.

5. A heat fixing apparatus according to claim 1, wherein said pressurizing member has an electro-conductive part, to which a commutating element is connected so that the electro-conductive part would be kept to have polarity reverse to that of toner.

6. A heat fixing apparatus according to claim 1, wherein the heat fixing apparatus is applied to an image forming apparatus provided with environment detection means for detecting at least one of temperature and humidity of operation environment, and said bias control means controls the bias voltage applied by the bias applying

means based on a detection result of said environment detection means.

7. A heat fixing apparatus according to claim 1, wherein the heat fixing apparatus is applied to an image forming apparatus capable of setting a plurality of recording material conveying speeds, and said bias control means controls the bias voltage applied by the bias applying means in accordance with the recording material conveying speed that is set.

8. A heat fixing apparatus according to claim 2, wherein the heat fixing apparatus is applied to an image forming apparatus capable of setting a plurality of recording material conveying speeds, the bias applying means applies the bias voltage in such a way that an electric potential difference between an electro-conductive part of the fixing member and the electro-conductive member disposed downstream of the fixing nip is smaller when a low conveying speed is set than when a high conveying speed is set, and a decrement amount of the bias voltage, which is varied in accordance with a number of heated recording materials in the case that a state in which feeding of a succeeding recording material

has been started by feeding means of the image forming apparatus when a trailing edge of a preceding recording material passes the fixing nip portion continues, is smaller when a low conveying speed is set than when a high conveying speed is set.

9. A heat fixing apparatus according to claim 1, wherein in the case that recording materials more than a predetermined number are fed consecutively, said bias control means has a constant bias voltage applied to a recording material that is fed after said predetermined number of recording materials.

10. A heat fixing apparatus according to claim 1, wherein the heating apparatus uses either a heating roller scheme or a film heating scheme.

11. An image forming apparatus comprising:

an image forming part that forms an unfixed image on a recording material;

a fixing member;

a pressurizing member in pressure contact with said fixing member to form a fixing nip for holding and conveying the recording material on which the unfixed image has been formed by said

image forming part so that said unfixed image formed on the recording material would be fixed as a permanent image;

an electro conductive member to be in contact with the recording material disposed downstream of said fixing nip with respect to a recording material conveying direction;

bias applying means for applying a variable bias voltage to at least one of said fixing member and said electro-conductive member; and

bias control means that varies, in the case that recording materials on which unfixed images have been formed are consecutively fed, the bias voltage applied by said bias applying means gradually or stepwise while the recording materials are passing.

12. An image forming apparatus according to claim 11, wherein in the case that a state in which feeding of a succeeding recording material has already been started by feeding means of an image forming apparatus at a time when a trailing edge of a preceding recording material passes a portion of the fixing nip, said bias control means determines that the recording materials are consecutively fed and decreases the bias voltage to be applied while the recording materials are

passing gradually or stepwise.

13. An image forming apparatus according to claim 12, wherein in an intervening period between the preceding recording material and the succeeding recording material during which the fixing member and the pressurizing member are in direct contact without a recording material between, said bias control means turns the bias voltage off.

14. An image forming apparatus according to claim 12, wherein said bias applying means includes at least one of means for applying a bias voltage with polarity same as that of toner to an electro-conductive part of the fixing member and means for applying a bias voltage with polarity reverse to that of the toner to an electro-conductive part of the pressurizing member, at least one of said means being capable of varying the bias voltage, and an electric potential difference between the electro-conductive part of the fixing member and the electro-conductive part of the pressurizing member before a leading edge of the recording material comes into contact with the electro-conductive member disposed downstream of the fixing nip with respect to the recording

material conveying direction is larger than the electric potential difference between the electro-conductive part of the fixing member and the electro-conductive part of the pressurizing member while the recording material is in contact with said electro-conductive member.

15. An image forming apparatus according to claim 11, wherein said pressurizing member has an electro-conductive part, to which a commutating element is connected so that the electro-conductive part would be kept to have polarity reverse to that of toner.

16. An image forming apparatus according to claim 11, wherein said image forming part is provided with environment detection means for detecting at least one of temperature and humidity of operation environment, and said bias control means controls the bias voltage applied by the bias applying means based on a detection result of said environment detection means.

17. An image forming apparatus according to claim 11, wherein said image forming part is capable of setting a plurality of recording material conveying speeds, and said bias control

means controls the bias voltage applied by the bias applying means in accordance with the recording material conveying speed that is set.

18. An image forming apparatus according to claim 12, wherein said image forming part is capable of setting a plurality of recording material conveying speeds, the bias applying means applies the bias voltage in such a way that an electric potential difference between an electro-conductive part of the fixing member and the electro-conductive member disposed downstream of the fixing nip is smaller when a low conveying speed is set than when a high conveying speed is set, and a decrement amount of the bias voltage, which is varied in accordance with a number of heated recording materials in the case that a state in which feeding of a succeeding recording material has been started by feeding means of the image forming apparatus when a trailing edge of a preceding recording material passes the fixing nip portion continues, is smaller when a low conveying speed is set than when a high conveying speed is set.